

## CLAIMS

1. A method for detecting a background intensity gradient within a microarray data set, the method comprising:
  - 5 computing metrics for features within the microarray data set; and  
when the metrics computed for a number of features are larger than a threshold value, determining that the microarray data set exhibits a background intensity gradient.
- 10 2. The method of claim 1 wherein a metric is computed for each feature in the microarray data set.
3. The method of claim 1 wherein a metric is computed for a selected number of features in the microarray data set.
- 15 4. The method of claim 1 wherein the metric computed for each feature is a metric related to a difference between mean and median pixel intensities within background regions of increasing size containing the feature.
- 20 5. The method of claim 4 wherein the metric computed for each feature is proportional to a size of a background region containing the feature with a greatest difference between the mean and median pixel intensity for pixels within the background region.
- 25 6. The method of claim 4 wherein the metric computed for a feature is proportional to a size of a background region containing the feature with a greatest difference between the mean and median pixel intensity for pixels within the background region, when a difference between a largest difference between mean and median pixel intensity for pixels within a background region and a smallest difference  
30 between mean and median pixel intensity for pixels within a background region is

greater than a threshold value, and otherwise the metric computed for a feature is a size of the feature.

7. The method of claim 4 wherein the metric computed for each feature is proportional to a size of a background region containing the feature with a difference between the mean and median pixel intensity for pixels within the background region near to, but not equal to, the size of a background region with a greatest difference between the mean and median pixel intensity for pixels within the background region.
8. The method of claim 4 wherein features are disk shaped, and the background regions of increasing size are annuli circumscribing the feature with increasing outer radii.
- 9 The method comprising forwarding, to a remote location an indication obtained by a method of claim 1 as to whether or not a microarray data set contains a background intensity gradient.
10. The method comprising receiving from a remote location an indication obtained by a method of claim 1 as to whether or not a microarray data set contains a background intensity gradient.
11. A computer program implementing the method of claim 1 stored in a computer-readable medium.
12. A method for characterizing background intensity gradients within a microarray data set, the method comprising:
  - computing metrics for features within the microarray data set; and
  - when the metrics computed for a number of features are larger than a threshold value,
    - grouping features with computed metrics by position; and

characterizing a background intensity gradient corresponding to each group of features by an area of the microarray surface corresponding to the group and by a position of the group on the surface of the microarray.

- 5     13.     The method of claim 12 further including characterizing a background intensity gradient corresponding to a group of features by an average computed metric for the features of the group.
14.     The method of claim 12 wherein a metric is computed for each feature in the  
10     microarray data set.
15.     The method of claim 12 wherein a metric is computed for a selected number of features in the microarray data set.
- 15     16.     The method of claim 12 wherein the metric computed for each feature is a metric related to a difference between mean and median pixel intensities within background regions of increasing size containing the feature.
17.     The method of claim 16 wherein features are disk shaped, and the background  
20     regions of increasing size are annuli circumscribing the feature with increasing outer radii.
- 18     The method of claim 12 further comprising forwarding, to a remote location a characterization of a background intensity gradient within the microarray data set.  
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19.     A computer program implementing the method of claim 12 stored in a computer-readable medium.
20.     A microarray data set analysis system comprising:  
30     a stored image of a microarray; and

- a processing entity that  
computes a metric for features within the image of the microarray; and  
when the metrics computed for a number of features are larger than a  
threshold value,  
5 determines that a background intensity gradient is present in the image  
of the microarray;  
groups features with computed metrics larger than a threshold value by  
position; and  
characterizes a background intensity gradient corresponding to each  
10 group of features.
21. The microarray data set analysis system of claim 20 wherein the processing  
entity characterizes the background intensity gradient corresponding to each group of  
features by one or more of:  
15 an area of the microarray surface corresponding to the group of features;  
a position of the group of features on the surface of the microarray; and  
an average computed metric for the group of features.
22. The microarray data set analysis system of claim 20 wherein a metric is  
20 computed for each feature in the image of the microarray.
23. The microarray data set analysis system of claim 20 wherein a metric is  
computed for a selected number of features in the image of the microarray.
- 25 24. The microarray data set analysis system of claim 20 wherein the metric  
computed for each feature is a metric related to a difference between mean and  
median pixel intensities within background regions of increasing size containing the  
feature.

25. The microarray data set analysis system of claim 24 wherein features are disk shaped, and the background regions of increasing size are annuli circumscribing the feature with increasing outer radii.